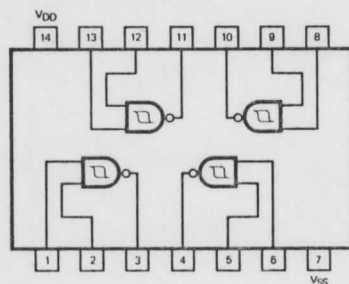


4093B

QUAD 2-INPUT NAND SCHMITT TRIGGER

GENERAL DESCRIPTION — The 4093B is a Quad 2-Input NAND Schmitt Trigger offering positive and negative threshold voltages, V_{T+} and V_{T-} which show very low variation with temperature (typically $0.0005 \text{ V/}^\circ\text{C}$ at $V_{DD} = 10 \text{ V}$) and typical hysteresis, V_{T+} to $V_{T-} \geq 0.33 V_{DD}$. Outputs are fully buffered for highest noise immunity.

LOGIC AND CONNECTION
DIAGRAM DIP (TOP VIEW)



NOTE:
The Flatpak version has the same pinouts (Connection Diagram) as the Dual In-line Package.

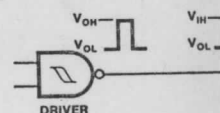
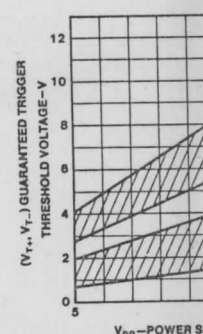
DC CHARACTERISTICS: V_{DD} as shown, $V_{SS} = 0 \text{ V}$ (Note 1)

SYMBOL	PARAMETER		LIMITS									UNITS	TEMP	TEST CONDITIONS
			V _{DD} = 5 V			V _{DD} = 10 V			V _{DD} = 15 V					
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX			
V _{T+}	Positive-Going Threshold Voltage		2.9	3.6	4.3	6.0	6.8	8.6	9	10	12.9	V	ALL	V _{IN} = V _{SS} to V _{DD}
V _{T-}	Negative-Going Threshold Voltage		0.7	1.4	1.9	1.4	3.2	4.0	2.1	5	6	V	ALL	V _{IN} = V _{DD} to V _{SS}
V _{T+} to V _{T-}	Hysteresis		1.0	2.2	3.6	2.0	3.6	7.2	3	5	8	V	ALL	Guaranteed Hysteresis = V _{T+} Minus V _{T-}
I _{DD}	Quiescent Power	XC			1			2			4	μA	MIN, 25°C	All Inputs at OV or V _{DD}
					7.5			15			30		MAX	
	Supply Current	XM			0.25			0.5			1	μA	MIN, 25°C	
					7.5			15			30		MAX	

NOTES:

1. Additional dc characteristics are listed in this section under Fairchild 4000B series CMOS family characteristics.

GUARANTEED TRIGGER TH



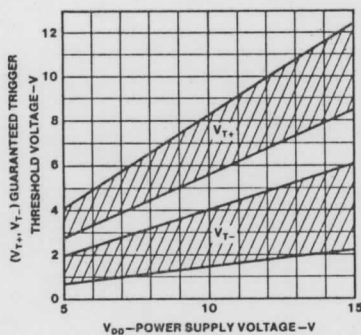
AC CHARACTERISTICS:

SYMBOL	PAR
t_{PLH}	Propagation De
t_{PHL}	
t_{TLH}	Output Transi
t_{THL}	

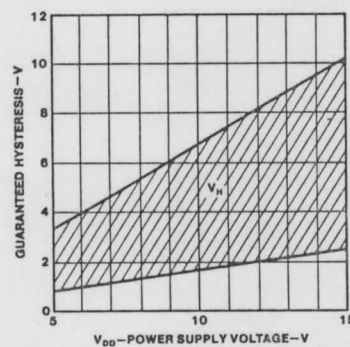
NOTE:
Propagation Delays and Ou

FAIRCHILD CMOS • 4093B

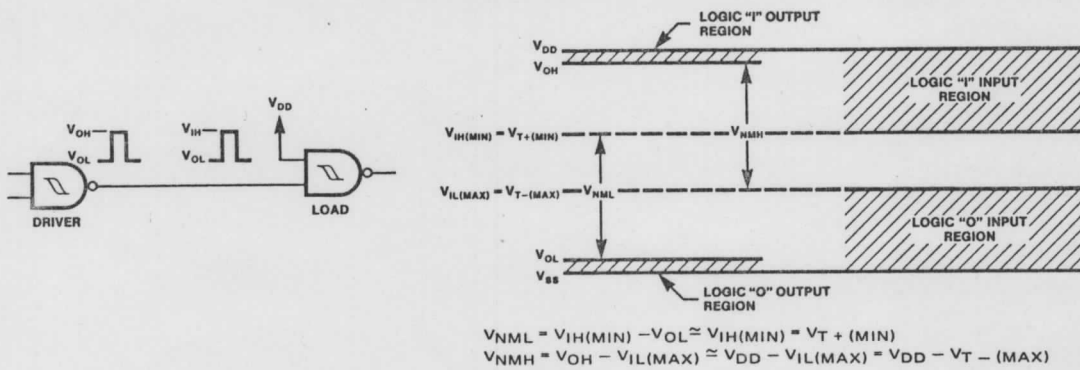
GUARANTEED TRIGGER THRESHOLD VERSUS V_{DD}



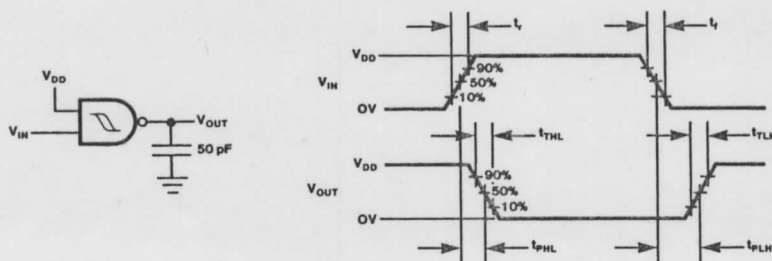
GUARANTEED HYSTERESIS VERSUS V_{DD}



INPUT AND OUTPUT CHARACTERISTICS



AC TEST CIRCUITS AND SWITCHING TIME WAVEFORMS



AC CHARACTERISTICS: V_{DD} as shown, $V_{SS} = 0$ V, $T_A = 25^\circ\text{C}$

SYMBOL	PARAMETER	LIMITS									UNITS	TEST CONDITIONS See Note 2
		V _{DD} = 5 V			V _{DD} = 10 V			V _{DD} = 15V				
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
t _{PLH}	Propagation Delay		60	110		25	60		20	48	ns	C _L = 50 pF, R _L = 200 kΩ Input Transition Times < 20 ns
t _{PHL}			60	110		25	60		20	48	ns	
t _{TLH}	Output Transition Time		60	135		30	70		20	45	ns	
t _{THL}			60	135		30	70		20	45	ns	

NOTE:
Propagation Delays and Output Transitions Times are Graphically Described in Section Under Series CMOS Family Characteristics.